INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2004/004427

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl[7] C07C251/80, 251/86, 317/44, 323/25, 323/60, 323/66,
C07D207/18, 211/46, 211/58, 211/60, 213/32, 213/44, 213/81,
231/04, 241/04, 243/08, 261/18, 249/12, 257/04, 295/08, 295/12,
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
Int.Cl[7] C07C251/80, 251/86, 317/44, 323/25, 323/60, 323/66,
C07D207/18, 211/46, 211/58, 211/60, 213/32, 213/44, 213/81,
231/04, 241/04, 243/08, 261/18, 249/12, 257/04, 295/08, 295/12,

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
CA(STN), REGISTRY(STN)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00/53208 A2 (NPS ALLELIX CORP.), 14 September, 2000 (14.09.00), Full text (Family: none)	1-8,16,24, 25,27-30,32, 34,46-52,56, 66
X	HODA A. ABDEL-HAMID, SAYED A. SHIBA, ABDEL-MOMEN A. EL-KHAMRY, AHMED S.A. YOUSSEF, "SYNTHESIS OF SOME BIOLOGICALLY ACTIVE HETEROCYCLES. REACTIONS OF THE HYDRAZIDE OF 2'-THIENOYL ANTHRANIC ACID AND ITS 3,5-DIBROMO DERIVATIVE", Phosphorus, Sulfur and Silicon and the Related Elements, 1982, Vol.72, No.1-4, pages 237 to 247	1-8,16,24, 26-30,32,36, 46-52,56,66

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
05 July, 2004 (05.07.04)	10 August, 2004 (10.08.04)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
Facsimile No.	Telephone No.

Form PCT/ISA/210 (second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2004/004427

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2-277073 A (Dainichiseika Color & Chemicals Mfg. Co., Ltd.), 13 November, 1990 (13.11.90), Full text & EP 613055 A1	1-8,16,24, 25,46-52
X	DJORDIE VLAOVIC, BOZIDAR LJ. MILIC, KENNETH MACKENZIE, "Modified Procedure for the Preparation of 5-Nitro-2-furylmethyline Diacetate and Its Use in the Synthesis of Some Novel (5-Nitro-2-furyl) azomethines via 5-Nitro-2-furaldehyde", Journal of Chemical Research, Synopses, 1989, No.6, pages 156 to 157	1-8,16,24, 25,27-30,32, 34,46-52,56
X	H.A. ZAHER, H. JAHINE, Y. AKENOOKH, Z. EL-GENDY, "Reactions of 2-p-Anisyl-3(4H), 1-benzoxazin-4-one with ammonia, Primary Amines, Hydrazine, Phenylhydrazine & Grignard Reagents, "Indian Journal of Chemistry, 1974, Vol.12, No.11, pages 1212 to 1215	1-8,16,24, 25,27-30,32, 34,38,46-52, 56,57
X	FR 2168136 A (FERLUI), 31 August, 1973 (31.08.73), Full text (Family: none)	1-8,16,24, 25,27-30,32, 34,38,46-52, 56,57,66
X	S.G. ABDEL-HAMIDE, "Synthesis and Chemistry of some Novel 3-Heteroaryl-quinazolin -4-one Derivatives and their Antimicrobial Effects", Journal of the Indian Chemical Society, 1997, Vol.74, No.8, pages 619 to 623	1-7,9,10,16, 24,25,27-30, 32,34,46-52, 56
X	M.B. DESHMUKH, D.S. DESHMUKH, "Synthesis and Biological Activity of some New Quinazolinyl Thazolidinones and Azetidinones", Journal of the Indian Chemical Society, 1995, Vol.72, No.12, pages 847 to 848	1-8,16,24, 25,27-30,32, 34,46-52,56
X	Mohamed F. Abdel-Megeed, A. Teniou, "Magnetic Anisotropic Effect As Demonstrated by High Resolution PMR in Some Benzoxazinones, Quina zolinones and Their Thino Analogues", Spectro scopy Letters, 1987, Vol.20, No.8, p.583-390	1-7,9,10,16, 24,25,27-30, 32,34,46-52, 56
X	Padi PRATAP REDDY, Cheppala KISTA REDDY, Padala SATYANARAYANAN. REDDDY, "Reaction of 2-Amino benzohydrazides with Schiff Bases. A New Route to 3-Benzylideneamino-4(3H)-quinazolines and 2-[2-(methylamino-phenyl]-5-aryl-1,3,4-oxadiazoles", Bulletin of the Chemical Society of Japan, 1986, Vol.59, No.5, pages 1575 to 1580	1-8,16,24, 25,27-30,32, 34,38,46-52, 56,57

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2004/004427

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	M.I. HUSAIN, SARVESHWAR SHUKLA, "Synthesis & Biological Activities of 3-(2'-Aryl-4'-oxothazolidin-3'-yl)-2-phenylquinazolin-4(3H)-ones", Indian Journal of Chemistry, Section B:Organic Chemistry Including Medicinal Chemistry, 1986, Vol.25B, No.5, pages 545 to 548	1-8,16,24, 25,27-30,32, 34,46-52,56, 66
X	Eisaku HAYASHI et al., "Kanjo Hydrazide Kozo o Fukumu Fukusokan Kagobutsu no Gosei to Sono Koshuyosei ni Tsuite", Journal of the Pharmaceutical Society of Japan, 1978 Nen, Vol.98, No.11, pages 1560 to 1565	1-8,16,24, 25,27-30,32, 34,38,46-52, 56,57,66
X	A.M. ABBADY, M. ANWAR, M.F. ABDEL-MEGEED, "2-ARYL-3-AMINE-4-QUINAZOLINONES", Acta Chimica.Academiae Scientiarum Hungaricae, 1976, Vol.91, No.3, pages 341 to 349	1-8,16,24, 25,27-30,32, 34,38,46-52, 56,57,66
X	M.M. El Kerdawy, M.Y. Yousif, A.A. El Emam, M.A. Moustafa, M.A. El-sherbeny, "Synthesis of Cartain Benzoxazine and Quinazoline Derivatives as Potential Antiinflammatory Agents", Egyptian Journal of Pharmaceutical Sciences, 1994, Vol.35, No.1-6, pages 1 to 20	1-7,9,10,16, 24,26-30,32, 36,46-52,56
X	M. Fekry Ismail, Abdel Momen A. El-Khamry, Fekria S. Sayed, Samir A. Emara, "Reaction of 6,8-Dibromo-2-Phenyl-3,1-Benzoxazin-4-One with Hydrazines, Schiff Bases and Azines", Egyptian Journal of Chemistry, 1991, Vol.32, No.4, pages 433 to 444	1-7,24,25, 27-30,32,34, 46-52,56
P,X	Manjusha Verma, Sundaram Singh, K.M. Singh, "SYNTHESISOF SOME NEW BENZOXAZINE DERIVATIVES OF BIOLOGICAL INTEREST, Heterocyclic Communications, 2003, Vol.9, No.5, pages 499 to 502	1-8,16,24, 25,27-30,32, 34,38,46-52, 56,57

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2004/004427

Box No. II **Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.: 87-96
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 87-96 fall under the category of methods for treatment of the human body by therapy and relate to a subject matter for which this International Searching Authority is not required, under the provisions of Article 17(2)(a)(i) of the PCT and (continued to extra sheet)

2. [ ] Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III **Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:
Compounds which have inhibitory activity against a sodium-dependent phosphoric acid transporter and have the partial chemical structure "-C-N-(benzene ring)-CO-N" are known (*Journal of Laboratory and Clinical Medicine*, 1983, Vol. 101, No. 2, p. 308-316).
In view of this, the technical feature "C-N-(ring A)-CO-N" common to the choices in claim 1 and other claims cannot be regarded as "a special technical feature (a technical feature which clearly shows a contribution to the prior art)" common thereto.
This means that claim 1 and other claims involve inventions which have no technical relationship involving (continued to extra sheet)

1. [X] As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest.

[X] No protest accompanied the payment of additional search fees.

Continuation of A. CLASSIFICATION OF SUBJECT MATTER
(International Patent Classification (IPC))

Int.Cl[7] 295/18, 307/68, 307/52, 333/38, 403/12, 405/12, 409/12, 491/10, A61K31/167, 31/341, 31/381, 31/40, 31/41, 31/415, 31/4196, 31/42, 31/4402, 31/4406, 31/4409, 31/443, 31/445, 31/4535, 31/4545, 31/455, 31/495, 31/496, 31/517, 31/519, 31/5375, A61P3/06, 3/10, 5/18, 5/20, 7/06, 9/04, 11/00, 13/12, 15/10, 17/04, 19/02, 19/08, 21/00, 25/02, 37/00, 43/00

(According to International Patent Classification (IPC) or to both national classification and IPC)

Continuation of B. FIELDS SEARCHED
Minimum documentation searched (International Patent Classification (IPC))

Int.Cl[7] 295/18, 307/68, 307/52, 333/38, 403/12, 405/12, 409/12, 491/10, A61K31/167, 31/341, 31/381, 31/40, 31/41, 31/415, 31/4196, 31/42, 31/4402, 31/4406, 31/4409, 31/443, 31/445, 31/4535, 31/4545, 31/455, 31/495, 31/496, 31/517, 31/519, 31/5375, A61P3/06, 3/10, 5/18, 5/20, 7/06, 9/04, 11/00, 13/12, 15/10, 17/04, 19/02, 19/08, 21/00, 25/02, 37/00, 43/00

Minimum documentation searched (classification system followed by classification symbols)

Continuation of Box No.II-1 of continuation of first sheet(2)

Rule 39.1(iv) of the Regulations under the PCT, to search.

Continuation of Box No.III of continuation of first sheet(2)

a special technical feature common thereto and are described in an alternative way.

(With respect to scope of international search)

Neither a Production Example for producing "a compound in which R^5 is alkyl, alkoxy, etc.", "a compound in which R^6 and R^7 each is hydrogen, alkyl, alkenyl, aryl, etc.", and the like nor test results which show that these compounds have inhibitory activity against a sodium-dependent phosphoric acid transporter are specifically described in the description.

The compounds which have the partial chemical structure "C-N-(benzene ring)-CO-N" and have inhibitory activity against a sodium-dependent phosphoric acid transporter and which are known to persons skilled in the art are limited to those shown in *Journal of Laboratory and Clinical Medicine*, 1983, Vol. 101, No. 2, p. 308-316. That "the compound in which R^5 is alkyl, alkoxy, etc.", "the compound in which R^6 and R^7 each is hydrogen, alkyl, alkenyl, aryl, etc.", and the like have inhibitory activity against a sodium-dependent phosphoric acid transporter cannot be regarded as a matter of technical common sense for persons skilled in the art.

Furthermore, the compounds which can interact with a receptor are generally limited to ones having specific sizes/chemical structures, functional groups, and properties (electrical properties including polarity and ionicity, hydrophilicity/hydrophobicity, etc.).

It cannot hence be presumed that "the compound in which R^5 is alkyl, alkoxy, etc.", "the compound in which R^6 and R^7 each is hydrogen, alkyl, alkenyl, aryl, etc.", and the like have the same inhibitory activity against a sodium-dependent phosphoric acid transporter as the specific compounds shown in Examples.

Consequently, all the compounds claimed in claim 1 and other claims cannot be sufficiently supported by the description.

Since claim 1 and other claims are not sufficiently supported by the description, the relevance of the subject matters of these claims to the prior art cannot be judged (with respect to an inventive step).

Therefore, an international search report was made only for the following compounds (1a), (1b), (2), and (3), which are sufficiently supported by the description, and for medicines, etc. each containing any of these compounds as an active ingredient (a search was made through prior art documents with respect to all the compounds shown in the Examples).

(1a) Those in which Z is $-N=CR^6R^7$, A is an optionally substituted, 5- to 9-membered, unsaturated carbocycle part or 5- to 9-membered, unsaturated heterocycle part, R^5 is optionally substituted aryl, heterocyclic group, or cycloalkyl, one of R^6 and R^7 is hydrogen or alkyl and the other is optionally substituted aryl, arylalkenyl, or heterocyclic group, R^{101} and R^{102} in combination represent =O, and R^{103} and R^{104} each is hydrogen.

(1b) Those in which Z is $-N=CR^6R^7$, A is an optionally substituted, benzene ring or thiophene ring, R^5 is optionally substituted phenyl, one of R^6 and R^7 is hydrogen and the other is optionally substituted phenyl, R^{101} and R^{104} in combination represent a bond, and R^{102} and R^{103} in combination represent a bond.

(2) Those in which Z is $-NH-CR^6R^7R^{17}$, A is an optionally substituted, benzene ring or thiophene ring, R^5 is optionally substituted phenyl or pyridyl, R^{17} is hydrogen, one of R^6 and R^7 is hydrogen and the other is optionally substituted phenyl, R^{101} and R^{102} in combination represent =O, and R^{103} and R^{104} each is hydrogen.

(3) Those in which Z is $-O-CR^6R^7R^{17}$, A and R^5 each is optionally substituted phenyl, R^{17} is hydrogen, one of R^6 and R^7 is hydrogen and the other is optionally substituted phenyl, R^{101} and R^{102} in combination represent =O, and R^{103} and R^{104} each is hydrogen.